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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,696	02/25/2002	Turguy Goker	50103-422	8366

7590 11/13/2003

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EXAMINER	
LE, TOAN M	
ART UNIT	**PAPER NUMBER**
2863	

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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PTO 90C (Rev 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/080,696	GOKER, TURGUY	
	Examiner	Art Unit	
	Toan M Le	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 February 2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Handbook of Statistical Methods for Engineers and Scientists", Wadsworth, Jr. (Referred hereafter Wadsworth, Jr.) in view of Andersen.

Referring to claims 1-7, Wadsworth, Jr. disclose a method of generating a statistical measure of performance, comprising: measuring the variable (page 2.8, equation 2.8); taking a predetermined number (n) of samples (page 2.8, equation 2.8); during sampling, accumulating a running sum of the n samples (page 2.8, equation 2.8), and accumulating a running sum of square of the n sample (page 2.10, equation 2.10); and at the end of the sampling, processing a final value of the sum of the n samples and a final value of the sum of the squares of the n samples, to produce the statistical measure of performance (page 2.10, equation 2.10) comprising standard deviation of the measured variable (page 2.11, equation 2.11), wherein the statistical measure of performance comprises variance of the measured variable (page 2.10, equation 2.10) and the method further comprises processing the variance to determine standard deviation of the measured variable (page 2.11, equation 2.11) and dividing the final value of the sum of the n samples by n to produce a mean value at the end of the sampling (page 2.8, equation 2.8), wherein the processing step comprises computing a mean from the final value of the sum of the n

samples (page 2.8, equation 2.8), computing a difference between the mean and the final value of the sum squares of the n samples, and dividing the difference by n-1 (page 2.10, equation 2.10) and computing square root of a result of the dividing step (page 2.11, equation 2.11).

Wadsworth, Jr. does not teach applying the method of generating a statistical measure of performance from a measured process variable during ongoing operation of a process.

Andersen discloses a method of generating a statistical measure of performance from a measured process variable during ongoing operation of a process, comprising: measuring the variable to generate a signal during the going operation of the process (col. 4, lines 55-57); taking a predetermined number (n) of samples from the signal during the ongoing operation of the process (col. 3, lines 55-62); during the sampling, accumulating a running sum of the n samples (col. 3, lines 55-57); and at the end of the sampling, processing a final value of the sum of the n samples to produce the statistical measure of performance comprises variance of the measured process variable (col. 3, lines 55-67; col. 4, lines 1-9), the mean from the final value of the sum of the n samples (col. 3, lines 55-62), and the standard deviation of the measured process variable (col. 4, lines 1-9).

Andersen does not teach the step of accumulating a running sum of the squares of the n samples without storing all n samples to compute a difference between the mean and the final value of the sum of the squares of the n samples in order to determine the variance and standard deviation.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the method as described by Wadsworth, Jr. to the process described by Andersen for measuring the process capabilities to improve yields and

product quality and modified the Andersen's process by accumulating a running sum of the squares of the n samples without storing all n samples to compute a difference between the mean and the final value of the sum of the squares of the n samples in order to determine the variance and standard deviation to reduce the computing time to cut cost.

As to claims 8-16, Wadsworth, Jr. disclose a method of generating a statistical measure of performance, comprising: generating a predetermined number (n) of samples (page 2.8, equation 2.8); accumulating a sum of the n samples (page 2.8, equation 2.8), and accumulating a sum of square of the n sample (page 2.10, equation 2.10); computing the statistical measure of performance in response to the sum of the n samples and the sum of squares of the n samples (page 2.10, equation 2.10) to provide standard deviation σ of the n samples of variable (page 2.11, equation 2.11) and output a mean value μ of the n samples of variable (page 2.8, equation 2.8), calculating $\sigma^2 = [1/(n-1)] [\Sigma x_i^2 - n\mu^2]$ where σ^2 is variance, μ is mean of the n samples, x_i is sample value taken in an i^{th} sampling interval in range from 1 to n (page 2.10, equation 2.10) and computing square root of a result of the dividing step (page 2.11, equation 2.11).

Wadsworth, Jr. does not teach a statistical value computation apparatus comprising a sampler, an interim computation module coupled to the sampler, a one time computation module comprises microcode modules coupled to the interim computation module, an adder, a register and a feedback, and a processor with a machine-readable medium to implement the method of generating a statistical measure of performance from a process variable measured during ongoing operation of a process.

Andersen discloses a statistical value computation apparatus including a machine-readable medium, for generating a statistical measure of performance from a signal representing

a process variable measured during ongoing operation of a process, comprising: a sampler responsive to the signal representing the measured process variable, for sampling the signal during ongoing operation of the process to generate a predetermined number (n) of samples (col. 6, lines 6-9); a computation module coupled to the sampler, for accumulating a sum of the n samples during ongoing operation of the process for computing the statistical measure of performance in response to the sum of the n samples comprises variance of the measured process variable, the mean from the final value of the sum of the n samples, and the standard deviation of the measured process variable (col. 6, lines 6-64).

Andersen does not teach the computation module comprising an interim computation module including a first accumulator loop, a multiplier, and a second accumulator loop and a one time computation module including microcode modules wherein each accumulator loop comprises an adder, a register and a feedback for accumulating a sum of the squares of the n samples without storing all n samples for computing the statistical measure of performance in response to the sum of squares of the n samples to compute the variance and standard deviation.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the method as described by Wadsworth, Jr. to the apparatus described by Andersen for measuring the process capabilities to improve yields and product quality and modified the Andersen's apparatus comprising the computation module comprising an interim computation module including a first accumulator loop, a multiplier, and a second accumulator loop and a one time computation module including microcode modules wherein each accumulator loop comprises an adder, a register and a feedback for accumulating a sum of the squares of the n samples without retaining all n samples for computing the statistical

measure of performance by accumulating a sum of the squares of the n samples for computing the variance and standard deviation to reduce the computing time to cut cost.

Referring to claim 17-18, Wadsworth, Jr. disclose a method of generating a statistical measure of performance, comprising providing a predetermined number of samples (page 2.8, equation 2.8); generating and outputting of at least one of variance and standard deviation of the measured parameter based on summation of the predetermined number of the samples and summation of squares of the predetermined number of the samples (pages 2.10-2.11, equations 2.10 and 2.11).

Wadsworth, Jr. does not teach a device for computing a statistical value comprising a sampler responsive to a signal representing the measured process parameter during operation and means for generating and outputting variance and standard deviation of the measured process parameter in real-time based on summation of the predetermined number of the samples and summation of squares of the predetermined number of the samples.

Andersen discloses a device for computing a statistical value comprising a sampler responsive to a signal representing the measured process parameter during operation and means for generating and outputting variance and standard deviation of the measured process parameter in real-time based on summation of the predetermined number of the samples (col. 6, lines 6-64).

Andersen does not disclose a device for computing a statistical value comprising a sampler responsive to a signal representing the measured process parameter during operation and means for generating and outputting variance and standard deviation of the measured process parameter in real-time based on summation of squares of the predetermined number of the samples.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the method as described by Wadsworth, Jr. to a device described by Andersen for measuring the process capabilities to improve yields and product quality and modified it for generating and outputting variance and standard deviation of the measured process parameter in real-time based on summation of the predetermined number of the samples and summation of squares of the predetermined number of the samples to reduce the computing time to cut cost.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,477,432 to Chen et al. U.S. Patent No. 6,556,884 to Miller et al.

U.S. Patent No. 5,987,398 to Halverson et al.

"Multivariate Statistical Process Control and Signature Analysis Using Eigenfactor Detection Methods", Chen et al., The 33rd Symposium on the Interface of Computer Science and statistics, June 2001

"A Statistical Analysis of Single and Multiple Response Surface Modeling", Smith et al., IEEE Transactions on Semiconductor Manufacturing, Vol. 12, No. 4, November 1999

"Statistical Methods for Semiconductor Manufacturing", Boning et al., Encyclopedia of Electrical Engineering, Feb. 1999

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M Le whose telephone number is (703) 305-4016. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Toan Le

October 17, 2003

John Barlow
Supervisory Patent Examiner
Technology Center 2800